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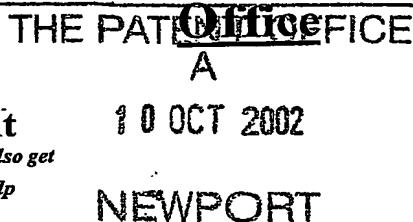
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1/77

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Patent application number  
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0223509.1

10 OCT 2002

Full name, address and postcode of the or of each applicant (*underline all surnames*)

Reckitt Benckiser (UK) Limited  
103-105 Bath Road  
Slough  
Berkshire  
SL1 3UH  
United Kingdom

10 OCT 02 E754681-1 D02903  
F01/7700 0.00-0223509.1

Patents ADP number (*if you know it*)

07972136002

~~081133-5600~~  
07972136002

If the applicant is a corporate body, give the country/state of its incorporation

England

Title of the invention

Apparatus and Method

Name of your agent (*if you have one*)

John C. McKnight

Address for service" in the United Kingdom  
in which all correspondence should be sent  
*(including the postcode)*

Reckitt Benckiser plc  
Group Patents Department  
Dansom Lane  
HULL  
HU8 7DS  
UNITED KINGDOM

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07799521001

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11.

I/We request the grant of a patent on the basis of this application.

Signature

John C McKnight

Date

9 October 2002

12. Name and daytime telephone number of Person to contact in the United Kingdom

John C. McKnight (01482) 583719

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### Apparatus and Method

The present invention relates to cleaning apparatus, and methods. In particular, the present invention relates 5 to cleaning apparatus and methods suitable for cleaning lavatories and other sanitary-ware fittings.

Lavatories may be cleaned using apparatus such as brushes. Alternatively, chemical cleaning agents such as 10 bleaches may be used. It is also known to use a combination of physical and chemical cleaning. EP 123152A describes a system comprising a cartridge having a cleaning brush attached thereto. Cleaning fluid is discharged from a flexible bag through the cleaning brush.

15

The above-mentioned type of apparatus and associated methods and methods have disadvantages in terms of low user satisfaction. This is believed to be for a number of reasons. These may include the perceived ineffectiveness 20 of either physical or chemical cleaning alone, and to the messiness and difficulty of dispensing cleaning fluid associated with the combined system, and the lack of a clearly visible dispense of cleaning fluid in that system.

25 It is an aim of preferred embodiments of the present invention to provide a convenient alternative to the abovementioned apparatus and methods.

According to a first aspect of the present invention 30 there is provided a lavatory brush comprising a handle and a bristle brush head having a proximal end depending from the handle and a distal end, the handle having a cavity for accommodating a cleaning fluid and means for impelling

cleaning fluid along a conduit from the handle to the brush head, the brush head having an outlet for cleaning fluid, proximate to the distal end thereof.

5 By "proximate" we mean that the outlet is at the distal end itself or closely adjacent to it.

Preferably, only the distal end has said outlet(s).

10 Preferably the or each outlet is arranged to issue cleaning fluid without contacting the bristles carried by the brush head.

15 Preferably, the cleaning fluid is contained in a canister within the handle. Preferably, the canister comprises a solid envelope. Preferably, the canister is removable from the handle and replaceable within the handle.

20 Preferably, the canister is vented by a one-way valve. Preferably the one-way valve is located within the handle of the lavatory brush. Preferably, the one-way valve is located such that it does not become submerged during use of the lavatory brush.

25

Preferably, the canister is vented to allow ingress of air as cleaning fluid is impelled from the handle.

30 Preferably, the means for impelling are operable by one hand. Preferably, the means for impelling are operable by a hand which is grasping and supporting the brush handle. Preferably, the means for impelling are operable by the hand which is grasping and supporting the

brush handle without adjustment of the position of the hand on the handle.

Preferably, the means for impelling are manually operated. Preferably, the means for impelling are actuated by a user's own force.

Preferably, the means for impelling comprises a pump. Preferably, the pump is actuated by a user's own force on a trigger. Preferably, the pump only allows egress of cleaning fluid from the canister when actuated.

Preferably, the lavatory brush comprises a plastics material, more preferably the toilet brush comprises a thermoplastics material.

Preferably, 200-400 ml, preferably 250-300 ml, of cleaning fluid can be contained in the handle.

Preferably, the cleaning fluid is a relatively viscous liquid. Preferably its absolute (dynamic) viscosity at 20°C is at least five times that of water, preferably at least fifty times.

According to a second aspect of the invention there is provided a method for cleaning a lavatory, the method comprising the steps of: (a) providing a lavatory brush comprising a handle and bristle brush head having a proximal end depending from the handle and a distal end, the handle having a cavity for accommodating a cleaning fluid and means for impelling cleaning fluid along a conduit from the handle to the brush head, the brush head having an outlet for cleaning fluid, proximate to the

distal end thereof; (b) providing cleaning fluid within the handle; (c) impelling the cleaning fluid by the impelling means along the conduit from the handle to the brush head, through the outlet proximate to the distal end 5 of the brush head and directing cleaning fluid passing through the outlet onto a surface to be cleaned; and (d) using the bristle brush head in combination with the cleaning fluid to clean the surface to be cleaned.

10 For a better understanding of the invention, and to show how embodiments of the same may be carried into effect, reference will now be made, by way of example, to the accompanying diagrammatic drawings in which:

15 Figure 1 shows a side view of a first embodiment of the invention;

Figure 2 shows a back view of the embodiment of Figure 1;

20 Figure 3 shows a front perspective view of the embodiment of Figure 1;

Figure 4 shows an exploded perspective view of the 25 embodiment of Figure 1;

Figure 5 shows a side view of components for use in the embodiment of Figure 1;

30 Figure 6 shows a perspective view of the embodiment of Figure 1 in use;

Figure 7 shows a perspective view of the embodiment of Figure 1 in combination with a stand;

5 Figure 8 shows an exploded perspective view of a second embodiment of the invention;

Figure 9 shows a perspective view of a canister being fitted to the embodiment of the Figure 8;

10 Figure 10 shows a perspective view of the embodiment of Figure 8 in use;

Figure 11 shows an exploded perspective view of a third embodiment of the invention;

15 Figure 12 shows a perspective view of a canister being fitted to the embodiment of Figure 11;

Figure 13 shows a perspective view of the embodiment 20 of Figure 11 in use;

Figure 14 shows an exploded perspective view of a fourth embodiment of the invention;

25 Figure 15 shows a perspective view of a canister being fitted to the embodiment of Figure 14; and

Figure 16 shows a perspective view of the embodiment 30 of Figure 14 in use.

Figure 17 shows a side view of a fifth embodiment of the invention; and

Figure 18 shows a cross-section view along line A-A of Figure 17.

Figure 19 shows an exploded view of the device shown 5 in Figures 17 and 18.

Referring now to Figures 1 to 7 there is shown a lavatory brush 100 comprising a bristle brush head 10 and a handle 20. The bristle brush head 10 comprises a 10 proximal end 12, a distal end 14, bristles 16 and an outlet 18. The handle 20 comprises a neck 22, a body 24, a lid 26 and a trigger 28. The neck 22 and body 24 of the handle 20 are formed from two conjoined sections; a front section 30 and a rear section 32.

15

The proximal end 12 of the bristle brush head 10 is attached to a distal end of the neck 22.

20 The lid 26 is movable between a first position in which it closes an aperture defined by a proximal end of the body 24 of the handle 20 and a second position in which the aperture is unobstructed. The lid 26 is hinged to move from the first position to the second position by hinge means (not shown). The lid 26 is secured in the 25 first position by an interference fit joint. A recess 23 is provided in the body 24 of the handle 20 to assist the user in moving the lid from the first position to the second position.

30 The body 24 of the handle 20 is shaped to allow it to be easily grasped by a user. The body 24 of the handle 20 is also shaped to allow it to contain a canister 34 of

cleaning fluid. The canister 34 is manufactured from a transparent plastics material.

A proximal end of the canister 34 comprises a vent 36. 5 The vent 36 comprises a one way valve allowing air to pass from the atmosphere into the canister 34 when the air space within the canister 34 is increased, during operation. Neither air nor cleaning fluid from within the canister 34 can pass through the vent 36 to exit the 10 canister 34.

A distal end of the canister 34 comprises a pump 38. The pump 38 can be actuated to draw cleaning fluid from within the canister 34. Actuation of the pump 38 reduces 15 the pressure within the canister 34 drawing air from the atmosphere through the vent 36 into the canister 34. When the pump 38 is not being actuated no cleaning fluid can exit the canister 34.

20 Within the lavatory brush 100 are contained a trigger mechanism 36 and a conduit 38. The trigger mechanism 36 cooperating with the trigger 28 to allow a user to impel cleaning fluid contained within the canister 34 along the conduit 38 to leave the bristle brush head 10 through the 25 opening 18 at the distal end 14. It does this without contacting the bristles. Rather, the fluid issues as a jet able to impinge upon the lavatory bowl surface.

To use the lavatory brush 100 a canister 34 of 30 cleaning fluid is inserted into the handle 20 through the aperture defined by a proximal end of the body 24 of the handle 20 when the aperture is unobstructed by the lid 26.

The lid 26 is then replaced to improve the aesthetic appeal of the lavatory brush 100, to prevent dirt from entering the handle 20 and to retain the canister 34 in place.

5

The pump 38 locates within the handle 30, communicating with the conduit 42 and the trigger mechanism 40.

10 A user grasps the body 24 of the handle 20 and can conveniently use an index finger to actuate the trigger 28. Symmetry of the device facilitates use by left and right-handed users. Actuation of the trigger 28 transmits force through the trigger mechanism 14 to the pump 38.  
15 Upon actuation, the pump 38 impels cleaning fluid from within the canister 34 into the conduit 42. Further actuation of the pump 38 impels cleaning fluid along the conduit 42 and through the opening 18 and the distal end of the bristle brush head 10.

20

A transparent portion 33 of the rear section 32 allows the level of cleaning fluid within the canister 34 to be easily observed by the user.

25 The user has a number of cleaning options facilitated by the lavatory brush 100. The user can spread a layer of cleaning fluid from the lavatory brush 100 over surfaces to be cleaned by actuating the trigger 28 before commencing work with the bristle brush head 10.  
30 Alternatively, the user can simultaneously brush and apply cleaning fluid. Furthermore, the brush can be used without cleaning fluid if desired.

The positioning of the outlet 18 proximate the distal end 14 of the bristle brush head 10 allows the user to accurately judge the amount of cleaning fluid dispensed. Also, the user can accurately direct the cleaning fluid to where it is required. The positioning of the outlet 18 also helps to maintain the bristles 16 free from a build-up of unused cleaning fluid.

The pump 38 is designed to avoid sucking any cleaning fluid, air or other fluid back into the canister 34. However, to further reduce this possibility a one-way valve (not shown) may be located in the conduit 42 immediately within the outlet 18. As the vent 36 is situated within the body 24 of the handle, it is unlikely to become submerged or exposed to other fluids. The vent 36 will therefore in use allow only air to pass through it and enter the canister 34.

As the pump 36 only dispenses cleaning fluid when being actuated by a user, the canister 34 can be swapped for one containing an alternative cleaning fluid without dripping or making other mess. Similarly, a canister 34 that is all but empty will not drip or leak when removed for replacement.

Figure 7 shows the lavatory brush 100 in combination with a stand 200. The stand 200 engages the lavatory brush 100 at an interface region between the neck 22 and the body 24 of the handle 20. The stand 200 allows the lavatory brush 100 to be conveniently and hygienically stored.

Referring now to Figures 8 to 10 there is shown a lavatory brush 101. Lavatory brush 101 comprises a different canister 35 to the canister 34 of Figures 1 to 7, and has a number of other differences to accommodate 5 the canister 35. Where meaningful, like reference numerals have been used for corresponding features between Figures 1 to 7 and Figures 8 to 10.

The handle 20 comprises an elongate section of a 10 plastics material attached to the proximal end 12 of the bristle brush head 10 through a collar 21. A proximal end 23 of the handle 20 comprises a pair of resilient projections 25 separated by a recess 27.

15 The canister 35 comprises a resilient envelope having a pair of diametrically opposed projections 37 extending from an upper region of its exterior surface. The canister 35 comprises a blow moulded thermoplastics envelope. The canister 35 locates within the handle 20 20 and is held in place by a snap fit joint formed by engagement of the projections 37 with the recess 27.

To impel cleaning fluid from the canister 35 the user squeezes the upper region of the canister 35. The user 25 may further squeeze the resilient projections 25 to compress the canister 35 therebetween.

Referring now to Figures 11 to 13 there is shown a lavatory brush 102. The lavatory brush 102 is adapted to 30 receive a canister 35A in the form of a deformable tube. The canister 35A locates within the handle 20 and is held in place by engagement with the lid 26. The lid 26 comprises a distal projection having an aperture 27A

defined therein. The aperture 27A engages with a projection 37A extending from an upper region of the interior surface of the handle 20. The lid 26 is held in place by a snap-fit joint formed by engagement of the 5 projection 37A with the aperture 27A.

To impel cleaning fluid from the canister 35A the user squeezes the upper region of the canister 35A through an open section of the handle 20 as can be seen in Figure 13.

Referring now to Figures 14 to 16 there is shown a lavatory brush 103. The handle 20 of the lavatory brush 103 is similar to that of the lavatory brush 101 of Figures 8 to 10. The handle 20 of the lavatory brush 103 comprises a pair of resilient projections 25B separated by a recess 27B. The recess 27B is occupied by resiliently flexible membrane. The membrane prevents dirt from accumulating in the recess 27B and also prevents a user's hand from becoming trapped between the projections 25B.

Referring now to Figure 17, there is shown a lavatory brush 300 comprising a brush head 320 and a body 310. Brush head 320 comprises a proximal end 322, a distal end 324, bristles 326 and an outlet 328. The body 310 comprises a handle portion 302, having proximal end 302A and distal end 302B, a body portion 312, having a proximal end 312A and a distal end 312B, handle portion 302 and body portion 312 being held together with ring 316. Ring 316 is connected to handle portion 302 at distal end 302B. Body 310 is formed by connecting distal end 302B of handle portion 302 to proximal end 312B of body portion 312 by engaging button 318. There are two engaging buttons (one opposite button 318 and not shown) but only one button 318

is acceptable. To open brush 300, engaging button(s) 318 is(are) pushed and handle portion 302 can be removed, allowing access to the inner cavity of body portion 312. Then, an appropriate can 351 can be removed, when empty, 5 and replaced with an appropriate replacement can.

Proximal end 302A of handle portion 302 comprises safety lock switch 330 and actuating switch 332. Safety lock switch 330 and actuating switch are interconnected 10 (as shown in Figure 18) so as to provide a child safety locking system to prevent accidental discharge of the cleaning fluid.

Distal end 324 of brush head 320 is attached to distal 15 end 312B of body portion 312. As shown in Figure 18, there is fluid communication through brush head 320 at outlet 328.

Figure 18 shows a cross-section of brush 300 shown in 20 Figure 17 along line A-A. Safety lock switch 330 is connected by spring 334, which is placed within spring holder 350, to actuating switch 332. When safety lock switch 330 is depressed, actuating switch 332 will be able to move, causing spring 334 to move together with spring 25 holder 350. When spring holder 350 moves, face 354 (of spring holder 350) pushes against bottom rim 352 of can 351 (which can be, among others, either a traditional aerosol can where propellant and liquid are intermixed or be a system where the liquid is placed within a bag which 30 is then placed within a can and the area between the outer wall of the bag and the inner wall of the can is pressurized with a propellant (the so-called "bag in can" or "barrier pack" aerosol package.). The bag is then

pressurized but no propellant is expelled. Examples such cans are found in United States Patent Nos. 3,022,923; 3,109,463; 3,756,476; 3,788,521; 3,896,970; 3,929,132; 4,067,499; and 6,439,430). At the end opposite bottom rim 5 352 is mounting cup 358, which carries a valve assembly (whose construction is well known in the art) having a valve 356, and can overcap 360 and actuator 364. Overcap 360 rests upon nib 375 which is molded into distal end 312B. Valve 356 is connected to opening 372 through 10 opening 370 (which is mounted within adapter 362) such that permits a liquid or aerosol foam to be discharged out outlet 328. Adapter 362 can be molded into distal end 312B or can be a separate piece which fits within an appropriate opening within distal end 312B. Those in the 15 art will recognize that valve 356 could be connected to one long tube that could extend from the can 351 all the way through the distal end of body portion 312B and through opening 372 until just at the opening of outlet 328.

20 When switches 330 and 332 are engaged, moving spring 334 and spring holder 350 against bottom rim 352 of can 351 as described above, can 351 will move forward towards the distal end 312B of body portion 312. Such movement 25 causes actuator 364 to engage with overcap 360, causing valve 356 to open, thereby allowing liquid or aerosol to flow through the aforementioned openings and/or tubes and ultimately out of opening 328. When switches 330 and 332 are disengaged and returned to their original position, 30 can 351 returns to its original position and actuator 364 disengages with overcap 360, causing valve 356 to close.

In Figure 19 the components numbered within the circles as shown correspond to the table set out below:

ITEM NO.	DESCRIPTION
1	HANDLE HALF-LEFT
2	SAFETY
3	EXTENSION SPRING
4	TRIGGER
5	HANDLE HALF-RIGHT
6	SLEEVE
7	52mm STAINLESS STEEL AEROSOL CAN WITH CHIME ASSEMBLY
8	ACTUATOR VALVE
9	ACTUATOR GUIDE TUBE
10	BODY
11	BRUSH
12	CADDY CANISTER
13	CADDY BASE

- 5       A lavatory brush and a method of cleaning employing the lavatory brush have been provided showing improved user satisfaction and effectiveness. The lavatory brush and cleaning method offer a number of different cleaning possibilities to the user, the user being free to select  
 10 which most suits their cleaning requirements. Furthermore, the lavatory brush provided is easy to use, easy to assess in use, does not leak or drip when the cleaning fluid canister is replaced, allows for accurate direction of cleaning fluid into the target surface, and  
 15 does not suffer from the bristle clogging and cleaning fluid retention problems associated with known fluid dispensing brushes.

CLAIMS

1. A lavatory brush comprising a handle and a bristle brush head having a proximal end depending from the handle and a distal end; the handle having a cavity for accommodating a cleaning fluid and means for impelling cleaning fluid along a conduit from the handle to the brush head, the brush head having an outlet for cleaning fluid, proximate to the distal end thereof.
- 10 2. A lavatory brush according to claim 1 wherein only the distal end has outlet(s).
- 15 3. A lavatory brush according to claim 2 wherein the or each outlet is arranged to issue cleaning fluid without contacting bristles carried by the brush head.
- 20 4. A lavatory brush according to any preceding claim wherein the cleaning fluid is contained in a canister within the handle.
- 25 5. A lavatory brush wherein the canister is of a self-supporting shape.
6. A lavatory brush according to claim 4 wherein the canister is removable from the handle and replaceable within the handle.
- 30 7. A lavatory brush according to any preceding claim wherein the means for impelling are manually actuated by a user's own force.

8. A lavatory brush according to claim 7 wherein means for impelling comprises a pump, actuated by a user's own force applied to a trigger.
- 5 9. A method for cleaning a lavatory, the method comprising the steps of: (a) providing a lavatory brush comprising a handle and bristle brush head having a proximal end depending from the handle and a distal end, the handle having a cavity for accommodating a cleaning fluid and having means for impelling cleaning fluid along a conduit from the handle to the brush head, the brush head having an outlet for cleaning fluid, proximate to the distal end thereof; (b) providing cleaning fluid within the handle; (c) impelling the cleaning fluid by the 15 impelling means along the conduit from the handle to the brush head, through the outlet proximate to the distal end of the brush head and directing cleaning fluid passing through the outlet onto a surface to be cleaned; and (d) using the bristle brush head in combination with the 20 cleaning fluid to clean the surface to be cleaned.
10. A lavatory brush substantially as hereinbefore described with reference to the accompanying drawings.
- 25 11. A method of cleaning a lavatory substantially as hereinbefore described

ABSTRACTAPPARATUS AND METHOD

5 A lavatory brush 100 comprises a handle 20 and a bristle brush head 10 having a proximal end attached to the handle and a distal end. The handle contains a cleaning fluid and has means for impelling the cleaning fluid along a conduit from the handle to the brush head.  
10 The brush head has an outlet 18 proximate to the distal end thereof.

[Figure 4]

1/9

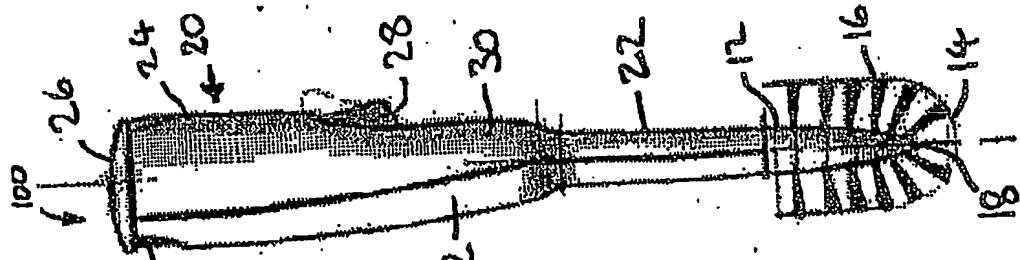


FIG 1

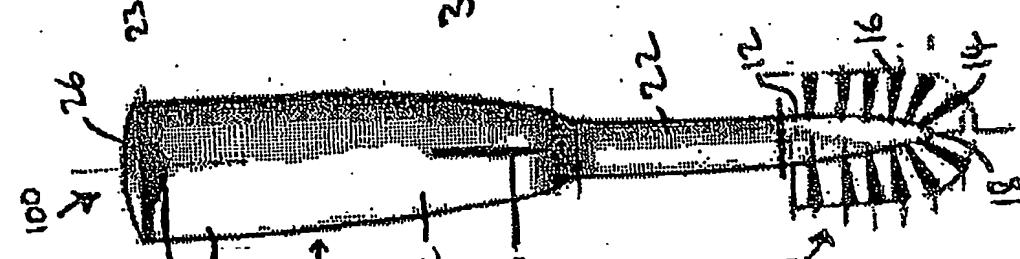


FIG 2

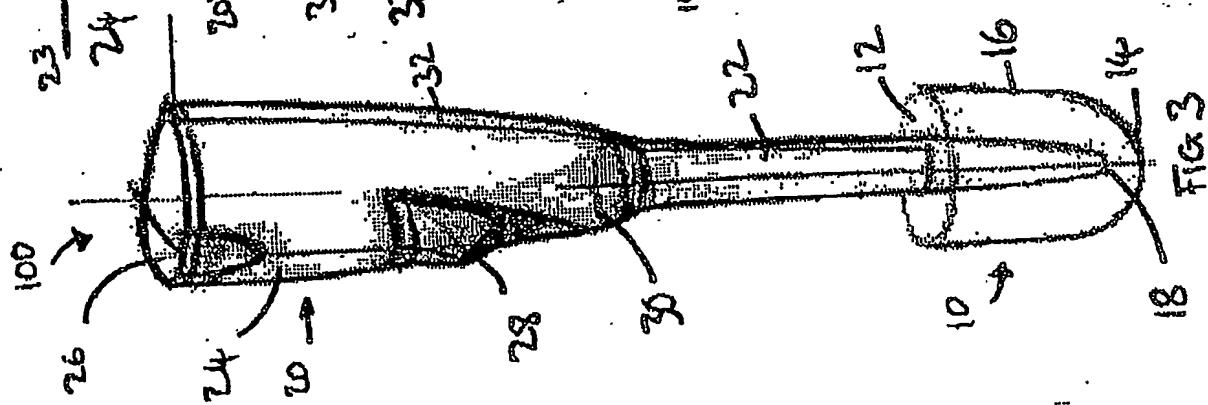


FIG 3

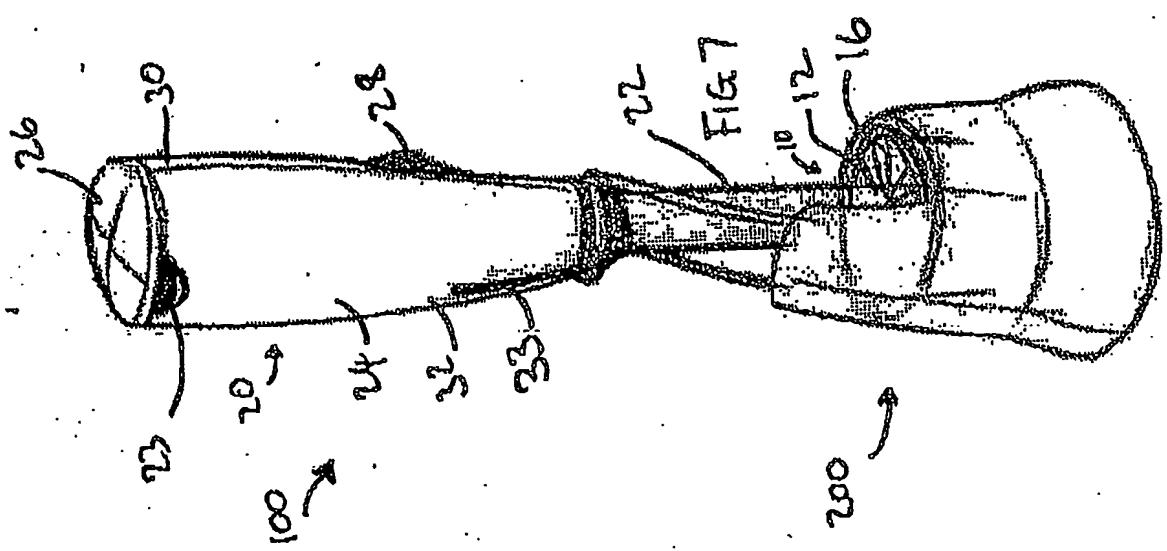
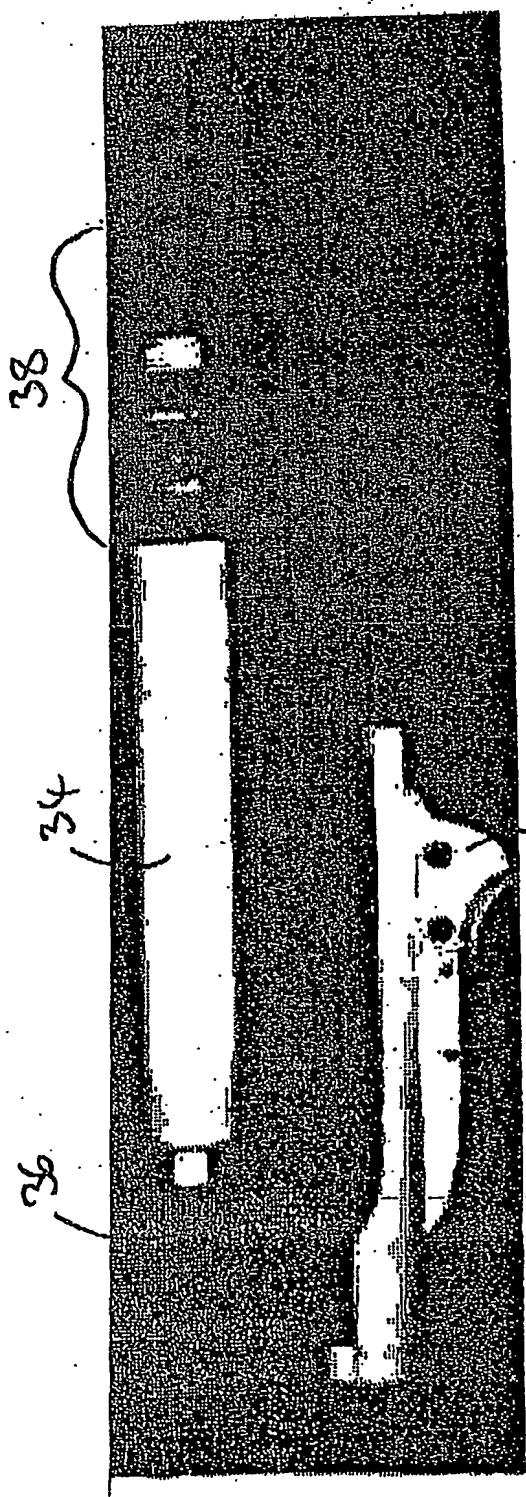


FIG 7

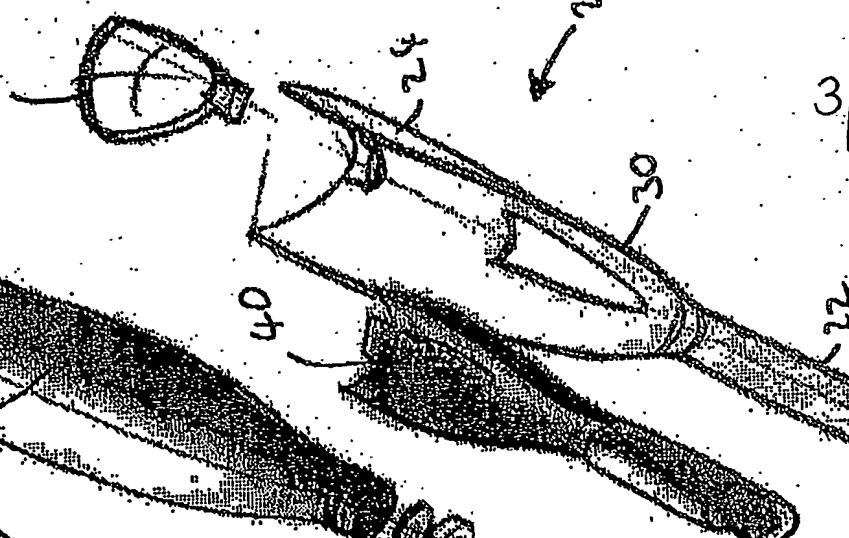


40 FIG 5

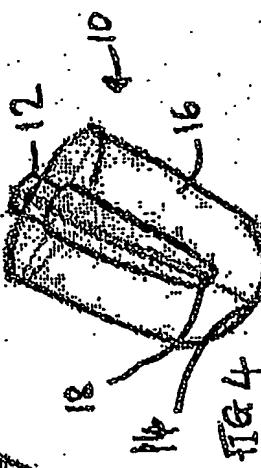
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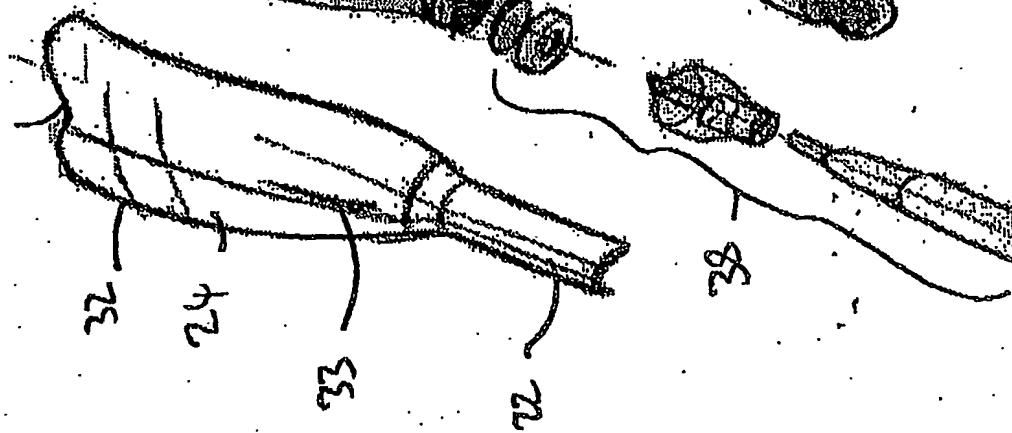
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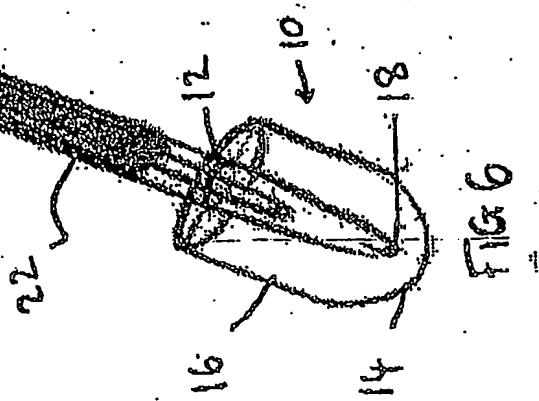


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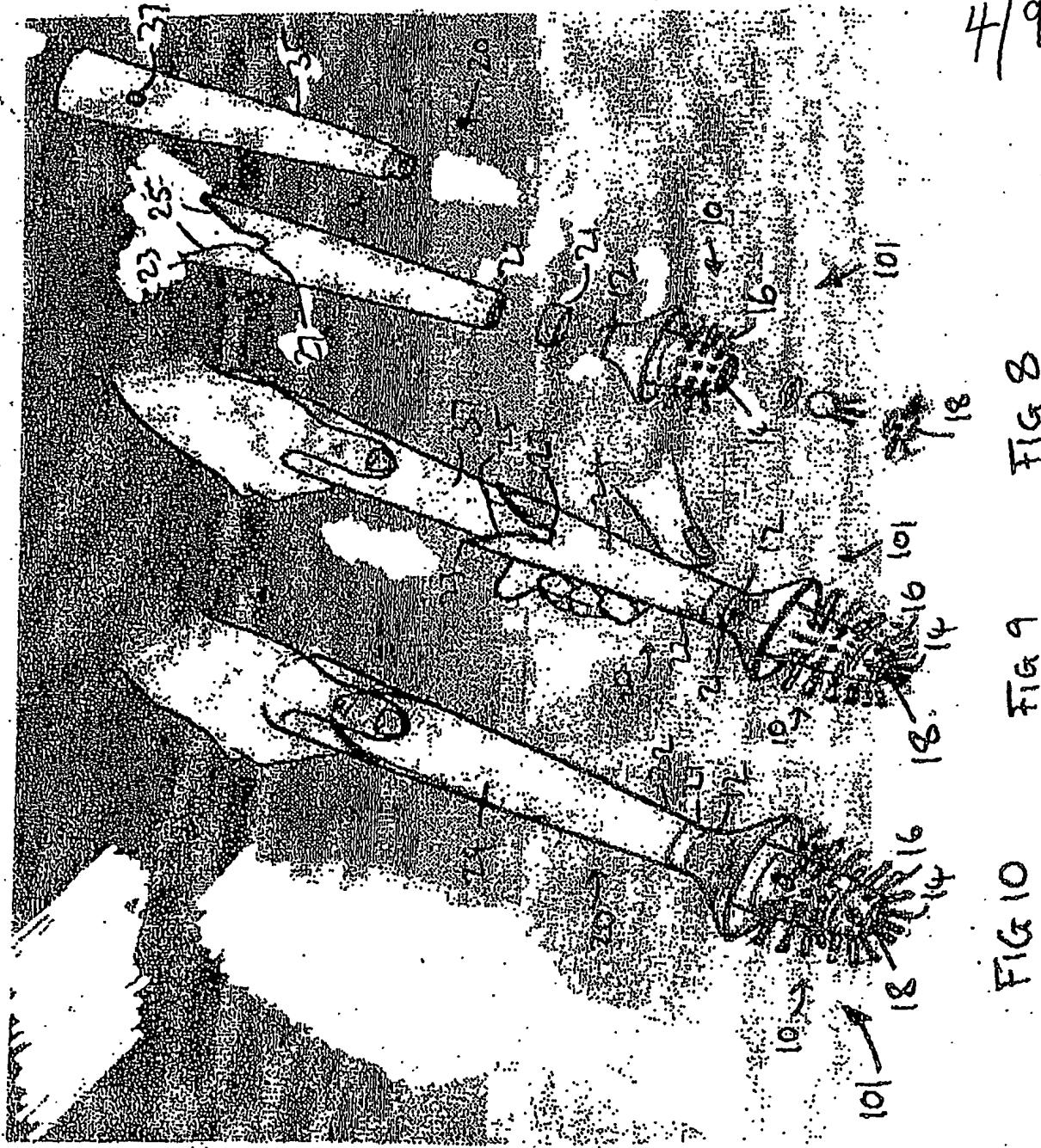


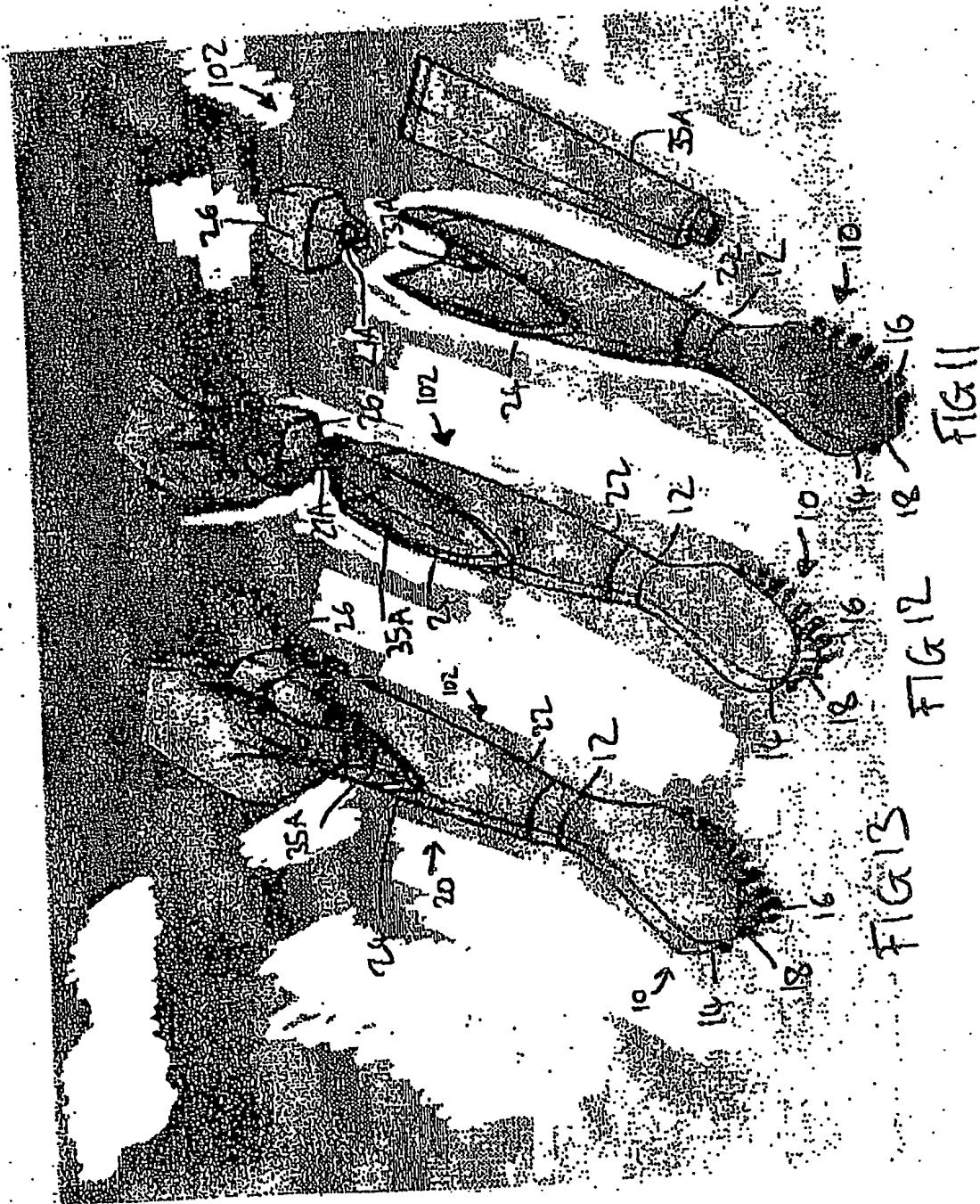
FIG. 10

Fig. 9 Fig. 8

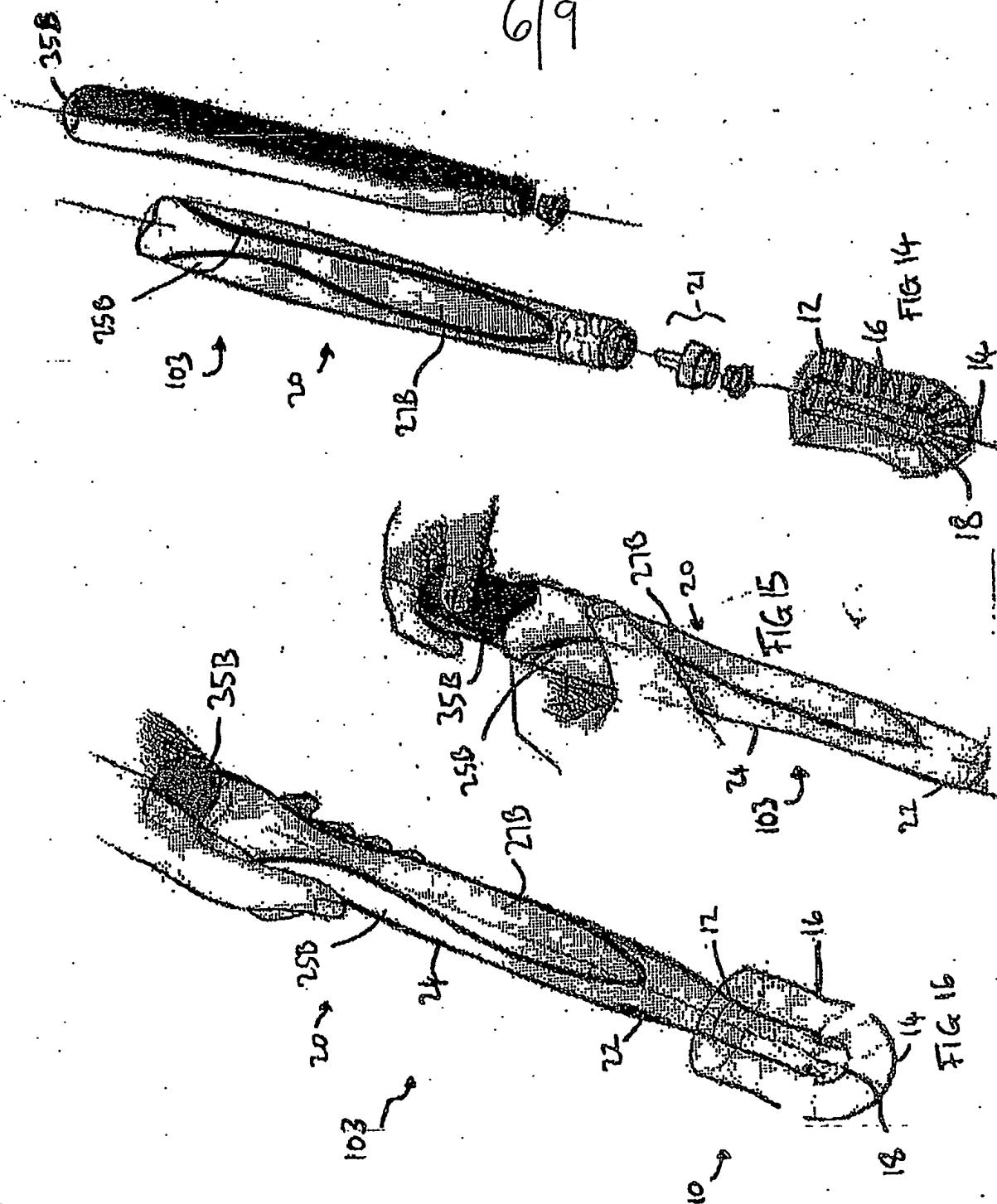
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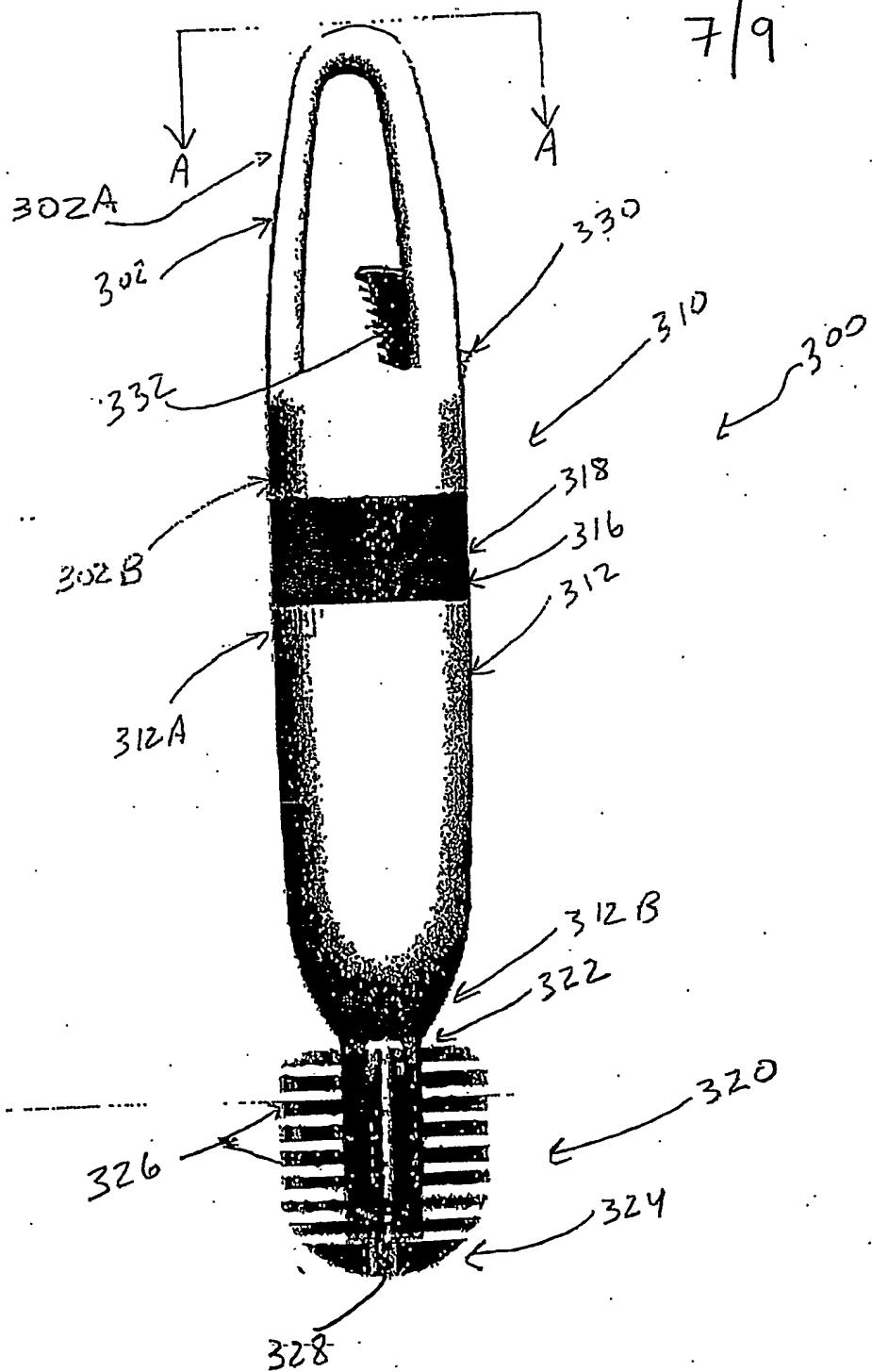
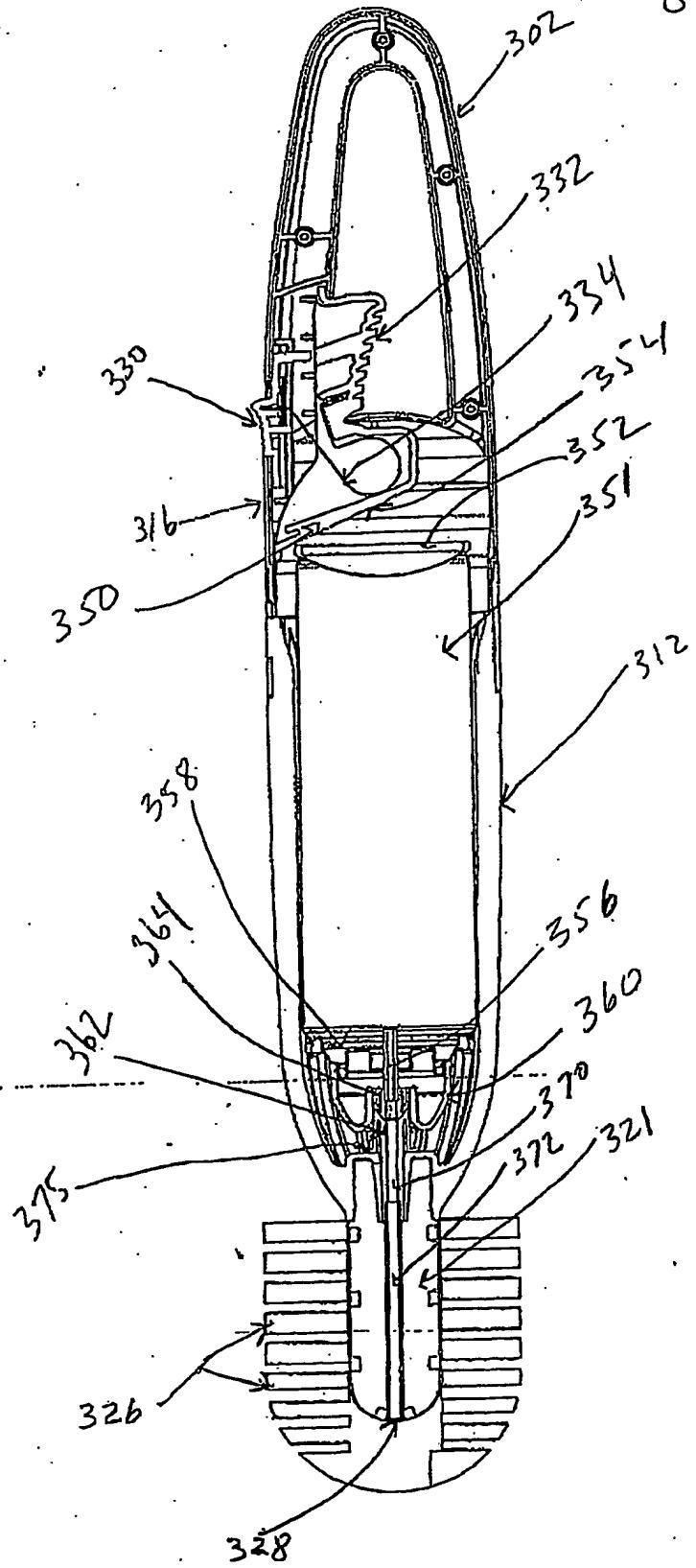


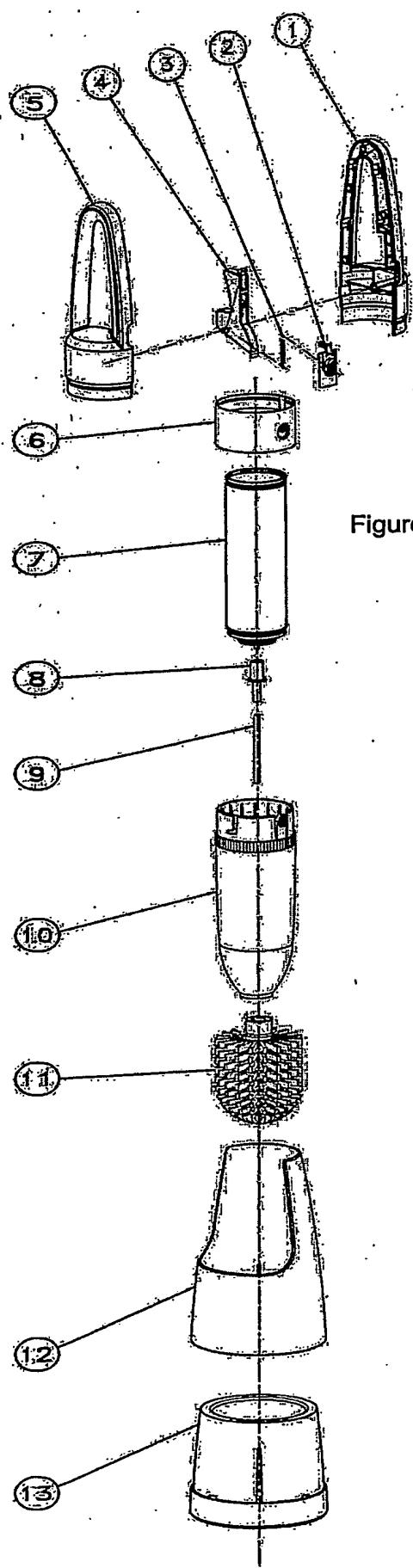
Fig. 17



- Fig 18

9/9

Figure 19



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